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25247 7590 07/22/2010 GORDON E NELSON PATENT ATTORNEY, PC 57 CENTRAL ST PO BOX 782 ROWLEY, MA 01969				
EXAMINER HUNG, YUBIN				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

genelson@comcast.net

# Office Action Summary

**Application No.**

10/536,708

**Applicant(s)**

HORVATIC ET AL.

**Examiner**

YUBIN HUNG

**Art Unit**

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,5-18 and 23-28 is/are rejected.
- 7) ☒ Claim(s) 2-4 and 19-22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 October 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date 10/5/05, 5/27/05
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities:

- P. 2, line 18: the URL should be deleted
- P. 7, line 20: "207" should have been "209"
- P. 12, line 20: "823" should have been "623"
- P. 12, line 21: "604" should have been "605"

Appropriate correction is required.

2. Claims 1, 24, 26 and 27 are objected to because of the following informalities:

- Claim 1, line 6: it should have been "watermarked" first transformation that is reversed, or, put in other words, that the reverse first transformation is applied to the watermarked first transformation result (and for examination purpose will be so interpreted). [The examiner recommends that the claim be amended per the preamble of claim 8, i.e., use "first intermediate digital representation" for the result of applying the first transformation.]
- Claim 24, line 3: for consistency change "the audio frame" to "the MPEG audio frame"
- Claims 26 and 27: delete all instances of "improved" and "improvement" (lines 1 & 6, and 1 & 3, respectively)

- Claim 27: as written it is not clear what is being reversed in “reversing the transformation of the watermarked transformed frame” (appears both in lines 8 and 10) since the watermarked transformed frame has undergone a reversible transformation, followed by adding watermark information (a transformation itself); i.e., a *composite* transformation has been applied to obtain the watermarked transformed frame. However, it is clear from the specification (e.g., Fig. 2, refs. the composite transformation of 217-221, which reverse the composite transformation of refs. 207-211) that the reversing refers to applying the reverse of the reversible transform only and does not include removing the watermark. Suggested changes (and for examination purpose claim 27 will be so interpreted):
  - line 6: change “that is a reversible transformation of” to “by applying a reversible transform to”
  - line 8: change “by reversing the transformation of” to “by applying the reverse of the reversible transform to”, and
  - line 10: per Fig. 3, refs 305-309 (equivalent to Fig. 2, refs. 207-211), which are applied before detection of 311 change “reversing the transformation of the watermarked transformed frame” to “applying the reversible transform to the watermarked MPEG audio frame”
- Claims 23 and 28: see the discussion and the suggestions for claim 27 above and make similar suggested changes

Appropriate correction is required.

***Priority***

3. The provisional application 60/429,634 filed on 11/27/02 does not provide sufficient written description to support the claims of the instant application and therefore the instant application is not entitled to the benefit of the filing date of 11/27/02. MPEP 2163.03(III). Specifically, the provisional application only discloses randomizing watermark information, not the digital representation of signal. (See P. 4, lines 2-3 "modulate watermark information into ransom noise patters before adding it to audio sample.)

***Claim Rejections - 35 USC § 101***

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 9 and 25 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows:

6. Claims 9 and 25 rejected under 35 U.S.C. 101 because their respective claimed invention is directed to non-functional descriptive material, which is non-statutory subject matter. MPEP 2106.01.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claim 27 recites a means (watermark information detector) that does not appear in combination with another recited element of means and is therefore subject to an undue breadth rejection. MPEP 2164.08(a).

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. Specifically, claim 7 recites a vague term “at the time...representation”. It is not clear what qualifies as “at the time”, e.g., within 1 nano-, micro-, mini-second; 1 second, minute, hour or day, and etc., of the event in question. In any event the method appears applicable with any of the above time frames. For examination purpose this limitation will be considered as a design choice.

***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Tian et al. (US 6,683,966).

14.

15. Regarding claim 1, Tian discloses

- making a first transformation of the original digital representation  
[Fig. 1, ref. 104 and corresponding descriptions in the specification]
- adding watermark information to the first transformation  
[Fig. 1, refs. 108 and corresponding descriptions in the specification]
- reversing the first transformation, the first transformation having the property that making and reversing the transformation spreads the watermark information across the original digital representation

[Fig. 1, ref. 110 and corresponding descriptions in the specification. Note that after the IWDT the watermark information is spread across the original digital representation]

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(Alternate rejection of claim 1:)

16. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Fridrich et al. ("Lossless data embedding—New paradigm in digital watermarking", EURASIP J. Applied Signal Processing, 2002:2, pp. 185-196).

17. Regarding claim 1, Fridrich discloses

- making a first transformation of the original digital representation  
[P. 192, right column: steps 1, 2 (in combination considered as a first transformation)]
- adding watermark information to the first transformation  
[P. 192, right column: steps 3, 4 and lines 1-3 of step 5]
- reversing the first transformation, the first transformation having the property that making and reversing the transformation spreads the watermark information across the original digital representation  
[P. 192, right column: last 3 lines of step 5. Note that since watermark information is applied to the set selected in step 1, which is part of the first



transformation, the watermark information is spread across the original representation]

### ***Claim Rejections - 35 USC § 103***

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

18.1. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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19. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tian et al. (US 6,683,966) as applied to claim 1 above, and further in view of APA (Admitted Prior Art of Fig. 1 and P. 3, lines 7-32).

20. Regarding claim 5 first note that Tian discloses all limitations of its parent claim 1. While Tian does not expressly disclose watermarking digital representation made using a perception model, such a limitation is taught by APA [Fig. 1, refs. 103-119 & P. 3, lines 14-15], and it would have been obvious for one to apply Tian's method to this digital data so generated (e.g., ref. 120 of Fig. 1) to widen its range of application. Additionally, APA further discloses filtering the watermarked digital representation according to the perception model [Fig. 1, refs. 107 (perception model) & 119 (filtering); note that APA further discloses imposing a bit rate and quality standard in 121 and it

would have been obvious to subject watermarked representation (ref. 120) to the filtering of 119 so as to satisfy the standard since bit rate and quality are well known concerns for one of ordinary skill in the art when designing compression schemes]

21. Regarding claims 6 & 7 the combined invention of APA and Tian further discloses

- (claim 6) modifying a watermarked digital representation according to a perception model when it is determined as not to conform to a quality and bit rate standard

[APA: Fig. 1, refs. 107 & 115-123. See also the analysis of claim 5]

- (claim 7) wherein the step of the method are performed at the time the original digital representation is made from a received digital representation  
[Note that the combined method of APA and Tian teaches the method which when applied, inherently has to be applied within a certain time period of the original digital representation becomes available. The exact timing is obviously purely a design choice since no element of claim 1 depends on that timing and thus the method of claim 1 does not, either. In other words, the method of claim 1 can perform equally well any time the original digital representation is available. See also the comments in the 112 (2<sup>nd</sup> paragraph) rejection of claim 7]

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22. Claims 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fridrich et al. ("Lossless data embedding—New paradigm in digital watermarking", EURASIP J.

Applied Signal Processing, 2002:2, pp. 185-196) and further in view of Mihcak et al. (US 2002/0154778).

23. Regarding claim 8, per the analysis of claim 1 Fridrich discloses the elements in the preamble and further discloses repeating the first transformation (P. 192, right column, "message extraction": steps 1 & 2). While Fridrich further discloses extracting embedded watermark, it does not expressly disclose determining the presence of a watermark.

However, Mihcak discloses determining the presence of a watermark in Fig. 4, ref. 460 (and paragraphs 106-114, especially 111). [Note that Mihcak also discloses applying the same first transformation first—see Fig. 4, ref. 420 and paragraph 108]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to determine the presence of watermark before extraction. The reasons for doing so would have been to avoid extraction a false watermark when none has been embedded, as Mihcak indicates in paragraphs 27-31.

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24. Claims 10-15 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA (Admitted Prior Art of Fig. 1 and P. 3, lines 7-32), and further in view of Fridrich et al. ("Lossless data embedding—New paradigm in digital watermarking", EURASIP J. Applied Signal Processing, 2002:2, pp. 185-196).

25. Regarding claim 10, APA discloses all limitations except for receiving and adding watermark information after quantization and before testing for conformance. Further, since bit rate [APA: Fig. 1, ref. 121] is a system constraint and adding additional information (such as a watermark) will affect the bit rate (of the resulted data), APA strongly suggests that watermarking be performed before the testing step of 121 in order to comply with the system constraint (of bit rate).

However, Fridrich teaches watermarking MPEG quantized frames [P. 192, right column, "Lossless data embedding": step 2 (quantized frame data, i.e., DCT coefficients) and steps 3 & 4 (watermark embedding)]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify APA with the teachings of Fridrich by watermarking quantized frames (i.e., after quantization). The reasons for doing so at least would have been to provide watermark to the MPEG-coded signals for, e.g., authentication (see the last three lines of the abstract of Fridrich) while complying with the bit rate.

26. Regarding claims 11-15 the combined invention of APA and Fridrich further discloses

- (claims 11, 14) submitting the watermarked MPEG audio frame to bit/noise allocation and quantization when a watermarked MPEG audio frame does not conform to the predetermined bit rate and quality

[APA: Fig. 1, refs. 119-123; note that Fridrich teaches watermarking, as per the analysis of claim 10]

- (claims 12, 15) filtering the watermarked MPEG audio frame with a filter based on the audio perception model

[APA: Fig. 1, refs. 107-119; note that Fridrich teaches watermarking, as per the analysis of claim 10]

- (claim 13) wherein the step of adding the watermark information to the MPBG audio frame further spreads the watermark information across the watermarked MPEG audio frame

[Fridrich: Similar analysis for claim 1 applies]

27. Regarding claim 26 APA discloses all limitations except for the maker that watermarks MPEG audio frame from a quantizer.

However, Fridrich teaches watermarking MPEG quantized frames [P. 192, right column, "Lossless data embedding": step 2 (quantized frame data, i.e., DCT coefficients) and steps 3 & 4 (watermark embedding)]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify APA with the teachings of Fridrich by watermarking quantized frames to obtain the invention of claim 26. The reasons for doing so at least would have been to provide watermark to the MPEG-coded signals in a lossless manner for, e.g., authentication (see the last three lines of the abstract of Fridrich).

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28. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable APA (Admitted Prior Art of Fig. 1 and P. 3, lines 7-32) and Fridrich et al. ("Lossless data embedding—New paradigm in digital watermarking", EURASIP J. Applied Signal Processing, 2002:2, pp. 185-196) as applied to claims 10-15 and 26 above, and further in view of Tian et al. (US 6,638,966).

29. Regarding claim 16, the combined invention of APA and Fridrich discloses all limitations of parent claim 13 but not expressly the following, which are taught by Tian:

- making a transformed frame that is a reversible transformation of the MPEG audio frame  
[Fig. 1, ref. 104 (reversible transform) and corresponding description in spec; see also Fig. 5, ref. 252. Note that MPEG audio frame is a kind of media object (see also Col. 1, lines 15-32)]
- adding the watermark information to the transformed frame  
[Fig. 1, ref. 108 (discloses adding watermark information to transformed frames) and corresponding description in spec; see also Fig. 5, ref. 260]
- making the watermarked MPEG audio frame by reversing the transformation of the watermarked transformed frame, the transformation and reversal thereof operating to spread the watermark information

[Fig. 1, ref. 110 (reversing) and corresponding description in spec; see also Fig. 5, ref. 262. Note that the DWT and IDWT will spread the watermark information since they operate on more than one datum]

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of APA and Fridrich with the teaching of Tian to obtain the invention specified in claim 16. The reasons for doing so at least would have been because watermarks applied in the frequency domain are more difficult to remove, as is well known in the art. [For example, see paragraph 6 of Choi et al. (US 2004/0091050), which is not relied upon for this rejection.]

30. APA further discloses the additionally limitations of claims 17 and 18:

- (claim 17) submitting the watermarked MPEG audio frame to bit/noise allocation and quantization when a watermarked MPEG audio frame does not conform to the predetermined bit rate and quality

[APA: Fig. 1, refs. 119-123; note that Fridrich teaches watermarking, as per the analysis of claim 10]

- (claim 18) filtering the watermarked MPEG audio frame with a filter based on the audio perception model

[APA: Fig. 1, refs. 107-119; note that Fridrich teaches watermarking, as per the analysis of claim 10]

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31. Claims 23, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tian (US 6,683,966) and further in view of Koukopolous et al. ("A compressed-domain watermarking algorithm for MPEG audio layer 3", ACM, 2001, provided as part of the IDS) and Mihcak et al. (US 2002/0154778).

32. Regarding claim 23, and similarly claims 27 and 28, note that Tian discloses the watermarking method recited in the preamble (Fig. 1) as applied to media object and Koukopolous discloses watermarking MPEG audio frames (see, e.g., Fig. 1 and sect. 3). (It therefore would have been obvious to one of ordinary skill in the art at the time of invention to apply the method of Tian's method to MPEG audio frames. The reasons for doing so at least would have been for the widely used MPEG-coded signals to be watermarked in a lossless manner)

Tian further discloses a method that reverses the transformation of a watermarked frame [Fig. 3, refs. 200 (watermarked representation), 204(reversing), 208 (decoding)].

The combined invention of Tian and Koukopolous does not expressly disclose determining the presence of a watermark. However, Mihcak discloses determining the presence of a watermark in Fig. 4, ref. 460 (and paragraphs 106-114, especially 111). [Note that Mihcak also discloses applying the same first transformation first—see Fig. 4, ref. 420 and paragraph 108]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to determine the presence of watermark before



extraction. The reasons for doing so would have been to avoid extraction a false watermark when none has been embedded, as Mihcak indicates in paragraphs 27-31.

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33. Claims 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tian (US 6,683,966)), and further in view of Koukopolous et al. ("A compressed-domain watermarking algorithm for MPEG audio layer 3", ACM, 2001, provided as part of the IDS).

34. Regarding claim 24 Tian discloses all limitations of claim 23 [e.g., per the analysis of claim 1] but does not expressly disclose applying the method to MPEG audio frames.

However, Koukopolous discloses watermarking MPEG audio frames (see, e.g., Fig. 1 and sect. 3). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to apply the method of Tian's method to MPEG audio frames. The reasons for doing so at least would have been for the widely used MPEG-coded signals to be watermarked in a lossless manner.

***Allowable Subject Matter***

35. Claims 2-4 and 19-22 are objected to as being dependent upon a rejected base claim, but would be allowable if claims 2 and 19 are rewritten in independent form including all of the limitations of the base claim and any intervening claims.

36. The following is a statement of reasons for the indication of allowable subject matter:

- Regarding claim 2, closest art of record does not disclose, teach or fairly suggest the step of reversing in such a way that a third transformation into the second domain is included.
- Regarding claim 19, closest art of record does not disclose, teach or fairly suggest the step of reversing the transformation in the recited manner

***Conclusion and Contact Information***

37. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Nishimura et al. (US 2004/0252834) – See Fig. 9A, refs. 27 (scrambling) and 29 (watermarking)

- Alattar et al. (US 2005/0135656) – teaches filtering watermarked signal [paragraph 71]
- Tio et al. ("Perceptual Audio Data Concealment and Watermarking Scheme Using Direct Frequency Domain Substitution", IEE Proc. Vis. Image Signal Processing, Vol. 149, No. 6, December 2002, pp. 335-340)

38. Any inquiry concerning this communication or earlier communications from the examiner should be directed to YUBIN HUNG whose telephone number is (571) 272-7451. The examiner can normally be reached on 7:30 - 4:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

39. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Yubin Hung/  
Primary Examiner, Art Unit 2624